ITS-AXX

Barrier Gate Control Radar
(Collision Avoidance Type)

User's Manual

Changsha MicroBrain Intelligent

Technology Co., Ltd.

Copyright Notice

Thank you for purchasing ITS-AXX Barrier Gate Control Radar with collision avoidance for smart access radar products. To ensure the best performance of the radar product, you are kindly invited to read this user's manual carefully, then you are strongly suggested to install and debug it strictly following the instructions provided in this manual.

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product belongs to Changsha MicroBrain Intelligent Technology Co., Ltd., and is protected by law. No unit or individual shall infringe these lawful rights.

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Content

1.Introduction

ITS-AXX barrier gate control radar is developed for the entrance and exit management of parking lots or underground garages. It can precisely control the rising and falling of the gate rod by cooperating with the main control board of the gate control system, effectively avoid the "accidental injury" of the gate rod to the passing vehicles or pedestrians in the radar field of view,and realize intelligent anti smashing.

ITS-AXX radar adopts the highly integrated RF chip SOC

scheme, which has the characteristics of small size, low cost, all-weather work, high detection sensitivity, high precision, easy to debug and installation, very good stability and reliability.

The working frequency of the radar is among 77GHz-81GHz, with Linear Frequency Modulation and Continous Waveform, which makes the available bandwidth

up to 4GHz.The range resolution is up to 4cm, and ranging accuracy is better than 2cm; Millimeter wave antenna adopts multiple transmitting and

multiple receiving configuration, with high angular resolution and angle measuring accuracy; signal processing and control unit adopts DSP + ARM dual core architecture. Through the joint optimization design of software and hardware, this product can accurately identify and distinguish the pedestrian, vehicle and other targets passing through the brake lever area, and avoid the phenomena of "smashing the vehicle", "smashing the person" and "not dropping the lever".

2.Technical Specifications

Terms	Parameter	Value
Working Condition	Input Voltage(Volts)	10~16
	Temperature Range(℃)	-40~85
	Power(W)	< 2.5
	Water Rissistance Level	IP67
	Connection Interface	RS485
	Size(mm)	107.5*73.2*18

Detection Zone	Along Road Width	Default ± 0.5m (configurable within ± 1m)
	Cross Road Range	Default 3 m (configurable within 6 m)
Upgrade and Debug	Online debugging	Serial Port Debug
	Online update	Serial Port Upgrade

3.Features

The appearance of ITS-AXX

radar is shown in Figure 1. The main features are:

- **LED indicators**

There are two LED indicators on the surface of the front surface of ITS-AXX radar.

The red LED is the power state lamp which will stay on when the power supply is turned on;

The green LED is the operating status lamp which will be automatically trigger on when objects detected in the access area and it goes off when there is no objects.

- **Detection Zone configuration**

The default detection Zone of the radar is 3 meters forward times 0.5 meters on the left and right sides. A configurable detection area can be set by the host computer software;

- **Configuration parameters saving and reload**

Configuration such as detection area could be automatically saved,and the latest configuration parameters after power failure and restart can be reloaded.

- **485 interface**

Stable communication and long

communication distance;

- **Firmware upgrade**

The firmware can be upgraded online through 485 interface with host computer without taking off the cover board and the new firmware can take effect just by restarting the power of radar.

- **Stable performance**

Millimeter wave radar sensing capablity stay nearly the same under different light illuminations, climates such as rain, fog or snow and dust.

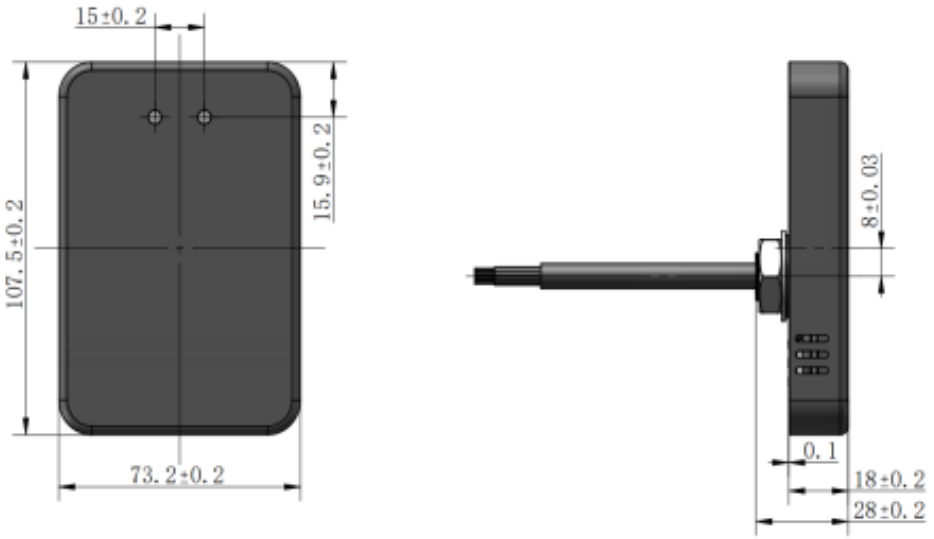

Figure 1. ITS-AXX Appearance and Size

4.Installation Instructions

The radar must be installed on the surface of gate box body and the radar surface with LED indicators must be perpedicular

to the lane (vehicle access) direction. The installation must follow the instructions below:

◆**Step1. Choice of radar mounting location.**

the radar LED indicator must be facing down which refers in figure 2. The installation position of radar must be 200-300mm away from the barrier gate and 550-750mm higher than the ground.

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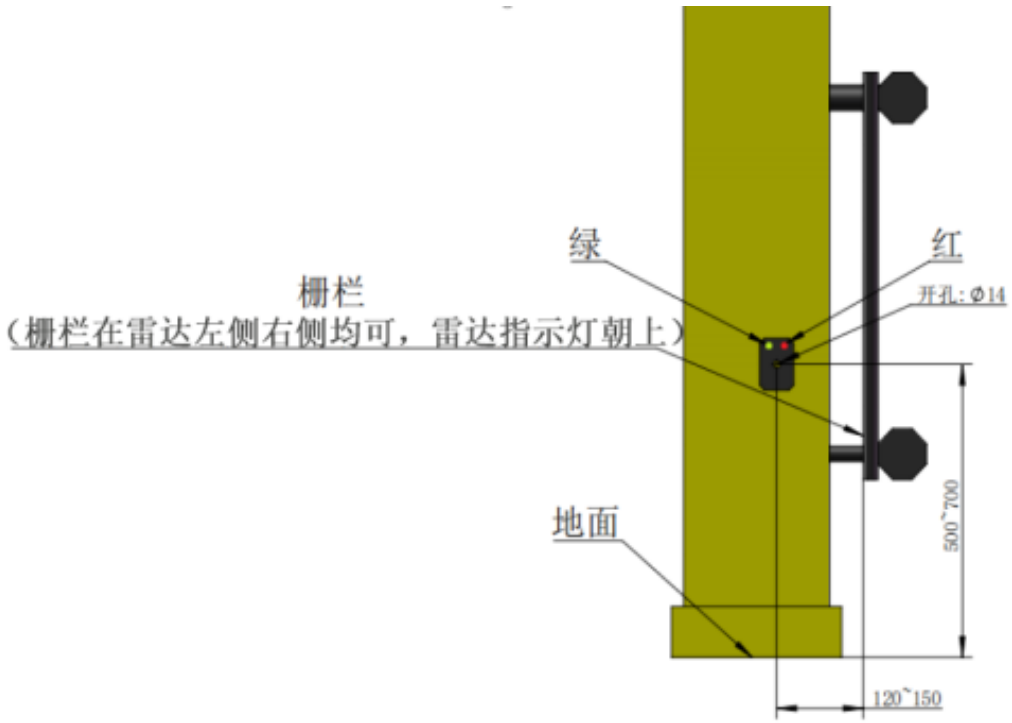


Figure 2. Radar Installation Demonstration

◆Step2. Trepanning

A mounting hole of M16 should be drilled on the surface of gate box according to the installation position illustrated in the former part(see figure 2).

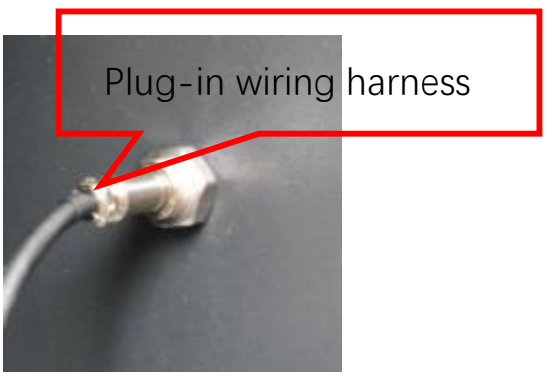
Recommended diameter of

drilling hole must be approximately 16mm.

◆Step3. Radar mounting and fixing.

(a)Radar through a circular hole

(b)Nut locking and fixing



(c)Plug in harness fixing

(d)Post installation display

Figure 3. ITS-A06 mounting and fixing

steps schematic

As shown in Figures 3 (a)-(d), the radar is fixed to the brake box through the bottom bolt. Firstly the radar is plugged into the brake box, then cover the washer with M16 screws to fix it, then insert the end of the wire harness into the radar in the correct direction and lock the metal buckle. The final installation effect is shown in Figure 4.

Figure 4.ITS-AXX Installation Demonstration

5.Interface Definition

There are 10 wires interface among which some of them should be connected to the mainboard of barrier gate. The definition of each interface is shown as followling table.

NO	CABLE ID	Color	Description
1	12V	Red	positive pole
2	GND	Black	negative pole
3	GND	Yellow	Reserved Ground
4	RX	White	B-
5	TX	Gray	A+
6	Normally open1	Blue	Normally open1
7	Normally open1	Green	Normally open1
8	Normally open2	Brown	Normally open2
9	Normally open2	purple	Normally open2
10	Enter	Orange	Enter

Here are the detailed connections of these interface to the gate control board.

- **Power supply connection:**

The red wire("VCC") **MUST** be connected to the positive output terminal of the 12V power supply,

The black wire ("GND") **MUST** be connected to the negative output terminal of the power supply.

- **Communication connection**

The white line “B-” is connected to T / R + terminal of 485;

The gray line "A +" is connected

to the T / R- terminal of 485;

●Manual Range Setting

The orange line "5V" is connected to the yellow line "reserved common ground" through the DIP switch which is made by ‘NO’ and ‘1’ triggerss.

●Barrier gate control signal:

The green and blue wires are normally open signals 1 of the radar onboard relay1.

The brown and purple wires are normally open signals 2 of the radar onboard relay.

The green and blue wires **MUST** be connected to the originally

loop detector interface and the public common signal interface.

6.Configuration Instructions

You can configure the radar detection area, the learning and recording environment by using the "Barrier Setting" tool software (the interface is shown in Figure 5), the serial port printing tool, and the one-click distance adjustment.

Note: The baud rate should be 115200.

Host Software Setting:

◆Step1: Select the serial port number

Insert the 485 connector to the host computer, to establish the connection between radar and the host computer, and the customers can find the port number in the device manager list of the computer and select it

(for the serial port connection method, refer to Section 5 of this manual for interface cable description).

◆Step2: Radar Sensing Range Setting

The factory default operating range of radar is 3 metres. The user can set it according to the length of the specific gate bar;

◆Step3: Boundary Setting

the factory default boundary of radar detection along the access road is limited to -0.5 m and 0.5m in the center of the gate bar. The default setting is recommended. Users can also customize the setting within ±1 m according to the actual situation.

◆Step4: Enable Custom Settings

After setting the working distance and range, click Reset.

After setting the barrier type, click Reset. The new setting parameters will take effect after restarting the radar.

7.Remarks

- Please read the following instructions carefully before using ITS-AXX radar:
- Ensure power supply stable to prevent bad influence on the performance of the radar.
- Avoid collision and falling to avoid physical damage of the radar.
- It should be cleaned in time when the radar surface is covered with foreign matter to ensure the transmissivity of

electromagnatica waves.

- Please reconfigure the radar parameters and power off and restart when the detection environment changes.
- Objects affecting target detection such as metal objects etc should not be placed within the detection area of radar to avoid triggering by mistake;
- The installed gate box must be stable, and the shaking of the box will easily lead to abnormal radar operation.
- Under normal circumstances, please set the detection distance according to the length of the pole. The

detection distance is slightly less than or equal to the length of the pole to prevent people or objects outside the brake lever from being detected by the radar.

Federal Communications Commission (FCC)

Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This product may not be collocated or operated in conjunction with any other antenna or transmitter.

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Packing List

No	Accessory Name	Quantity
1	ITS-AXX Radar	1
2	M16 nut	1
3	Waterproof rubber ring	1
4	gasket	1
5	Plug-in wiring harness	1

Service Hotline：

0731-89909918(extension 802)